

REMARKS

This application is believed to be in condition for allowance, and reconsideration is respectfully requested.

Claims 1-12 remain pending in the application.

Claims 1-12 were rejected under 35 USC §103(a) as being unpatentable over SIDIKOU-SEYNI et al. 1992 ("SIDIKOU-SEYNI") in view of TAN et al. 1990 ("TAN") and the discussion of the RICK article at the paragraph bridging pages 2 and 3 and page 3, 1st and 2nd paragraphs of the present specification ("RICK") and further in view of DELESALLE et al. US 6,803,497 ("DELESALLE"). This rejection is respectfully traversed for the reasons that follow.

The Official Action offered SIDIKOU-SEYNI for teaching F1 hybrid plants obtained by crossing *Cichorium Intybus* with *Cichorium Endivia*, which appeared to be phenotypically normal.

However, as recognized by the Official Action, SIDIKOU-SEYNI do not teach the steps of selfing F1 hybrids to produce F2 hybrids and forcing the F2 hybrid plants under the specified nutriment solution and room temperatures (see beginning of page 4 of the office action).

TAN, which do not teach a method for obtaining F2 generation plants, was offered for teaching a method for improving marketable yield and quality of chicory comprising a step of forcing.

RICK was offered for describing the method for obtaining F2 generation plants from an initial crossing between *Cichorium Intybus* with *Cichorium Endivia*.

DELESALLE was offered for teaching a method for producing recombinant Chicory plants using *Cichorium Intybus* with *Cichorium Endivia* to produce F1 generation hybrid plants.

The Official concludes that it would have been obvious for the one skilled in the art to:

- use the method of producing F1 hybrids as taught by SIDIKOU-SEYNI, and

- modify SIDIKOU-SEYNI's method by incorporating the forcing technique taught by TAN to obtain the improved F2 hybrids of the claimed invention.

However, this combination cannot render obvious the claimed invention due to the deficiencies of the various documents for reference purposes.

SIDIKOU-SEYNI

As recognized by the Official Action, SIDIKOU-SEYNI does not teach the steps of selfing F1 hybrids to produce F2 hybrids and forcing the plants under the specified conditions of claim 1.

Indeed, SIDIKOU-SEYNI exclusively teaches a method for the *in vitro* multiplication of the "474" plant through methods of plant regeneration from protoplasts. Thus, the plants obtained by SIDIKOU-SEYNI are clones of the "474" plants, i.e., still F1

hybrid plants, and not subsequent generation plants as claimed in the present invention.

Still further, because the aim of SIDIKOU-SEYNI was simply on clones, not obtaining hybrid plants of further generation(s), then one skilled in the art would have found strictly no motivation in SIDIKOU-SEYNI to obtain hybrid plants of further generation(s), including hybrid plants of F2 generation by self-fertilization of F1 generation hybrid plants like in step b) of the claimed method.

Indeed, the one skilled in the art would have found strictly no suggestion in SIDIKOU-SEYNI that would have guided him towards performing the specific steps c) and d) that follow the self-fertilization step of the claimed method.

TAN

TAN clearly fails to remedy the shortcomings of SIDIKOU-SEYNI for reference purposes for at least the four reasons:

(1) TAN is aimed at improving the yield and quality of chicons through a method consisting of applying a pressure to the developing chicons, so as to avoid the growth drawbacks that are experienced by growing chicons with methods involving a forcing step without cover (see the abstract of TAN).

The technical solution of TAN was to apply pressure to the developing chicons by placing on top of the shoots a piece of

polyurethane foam, so as to provide a cushion for application of downward pressure (see TAN, page 1396, right column, middle of the last paragraph).

This device of TAN mimics the pressure of the soil on the roots as in soil- covered forcing conditions.

(2) It flows from the above description of TAN that these authors were not interested at all in producing novel hybrid plants by methods comprising steps of crossing and selection.

Thus, by definition, TAN could not teach to one skilled in the art any one of the steps b) to f) of the claimed method.

(3) Indeed, because TAN relates to an improvement in the growing of hydroponically forced chicory, the method that they disclose comprises a forcing step.

However, the forcing step of the method of TAN was performed at 11 +/- 1°C in a forcing solution (see TAN, page 1396, right column, middle of the second paragraph).

Thus, even if the teachings of TAN are artificially used, it clearly flows from the preceding remarks that TAN does not disclose nor suggest to one skilled in the art the specific condition of the step d) of forcing of the claimed method.

(4) Thus, contrary to the position of the Official Action, TAN could in no way overcome the lack of teachings of SIDIKOU-SEYNI for arriving at the claimed invention.

RICK

Regarding RICK, which is provided along with the IDS which accompanies this response, this article teaches the production of F1 and F2 generation plants, the said F2 generation plants being produced through self-fertilization of F1 plants between *Cichorium Intybus* and *Cichorium Endivia*.

RICK further teaches that the F1 and subsequent F2 generation plants display a high heterogeneity in vigor "*it is evident from this survey and from the great variability in vigor that many combinations of the genes of chichory and endive are disharmonious to the extent that they lower markedly the level of fertility and vigor*" (see RICK, page 464, last sentence).

RICK further discloses that "*all these taken together, would constitute a considerable barrier between chicory and endive*" (see page 465, second sentence).

Also, according to RICK, the F2 generation plants are 'often flattened, twisted and deformed in other ways' (see page 465, 6th paragraph).

It clearly flows from the overall teachings of discussed above that RICK essentially describes the very poor quality and weakness of the F2 generation plants obtained by self fertilizing the F1 generation plants obtained after crossing *Cichorium Intybus* and *Cichorium Endivia*.

In other words, the teachings of RICK would have clearly dissuaded one skilled in the art to generate F2 hybrid plants by self fertilizing F1 hybrids.

Moreover, even if one skilled in the art would have performed a step of self fertilization of the F1 generation plants in view of obtaining F2 generation plants, one skilled in the art would have still not arrived at the claimed invention, since the method of RICK ends at the step of obtaining the F2 generation plants by self-fertilization.

Thus, by definition, RICK is silent on the potential usefulness of additional steps and could not teach to the one skilled in the art anyone of step c) to f) of the claimed method.

In other words, RICK, just like TAN, does not contain any teaching, additional to those of SIDIKOU-SEYNI that would have guided one skilled in the art towards the claimed methods and plants.

Furthermore, the Official Action asserted that one of ordinary skill in the art would have been motivated to produce F2 hybrid chicory and subsequent generation plants by selfing as taught by RICK given that the agronomic performance of F1 and further generation plants in chicory are superior to both parent, typically in vigor, yield and uniformity as known to one of ordinary skill in the art.

Should the Examiner maintain such assertion of "what is known" is maintained, Applicant respectfully requests an

Affidavit under 37 CFR §1.104 (d) 2. The applicant indeed believes such generalization of what is allegedly known, for example in corn breeding where the heterosis phenomena is indeed known and used, is improper. RICK, on the contrary, states that the FT hybrids do not grow with noticeable greater vigor than either parent (see page 461, second paragraph, last sentence).

DELESALLE

Turning now to DELESALLE, these authors disclosed a method for producing a chicory plant that exhibits cytoplasmic male sterility from *Helianthus Annuus*. More precisely, DELESALLE teaches that the cytoplasmic male sterility from *Helianthus Annuus* can be transferred through protoplast fusion to *Cichorium Intybus* (see examples 1 and 2).

As it was already stated, the method of DELESALLE implies introducing into cells of a chicory plant a mitochondrion of a male sterile plant that comprises the ORF522 of *Helianthus Annuus*. As shown in example 1, such a method uses protoplast fusion between protoplasts from chicory and protoplasts from *Helianthus Annuus*.

Again, DELESALLE does not disclose, nor teach, any step of crossing between *Cichorium Intybus* and *Cichorium Endivia*.

DELESALLE only specifies that the recombinant plant cells comprising the recombinant cytoplasm may belong to a species selected from among *Cichorium Intybus* and *Cichorium*

Endivia (see column 2, lines 22-42). Thus, what DELESALLE discloses is that the recombinant plant cells that may be used originate either from *Cichorium Intybus* and *Cichorium Endivia*, thus either from one species or from the other species.

DELESALLE also specify that the recombinant plants obtained by regeneration of the recombinant plant cells may be used in an essentially non-biological method of preparing plant hybrids, comprising a step wherein "*a plant which can be obtained by the [above-described] method is crossed with a plant of the same species...*" (Emphasis added.)

This means that, at most, DELESALLE teaches to one skilled in the art that the recombinant plants from *Cichorium Intybus* may be crossed with a none-recombinant plant from *Cichorium Intybus* and that a recombinant plant of *Cichorium Endivia* may be crossed with a non-recombinant plant from *Cichorium Endivia* (see column 2, lines 62-67).

Thus, in claim 9 cited in the Official Action, the method comprising crossing the regenerated chicory plant as the female parent with a second chicory plant refers to the previously cited passage of column 2, lines 62-67 wherein it is stated that *Cichorium Intybus* is crossed with *Cichorium Intybus* and *Cichorium Endivia* is crossed with *Cichorium Endivia*.

It flows from the above analysis that DELESALLE clearly but exclusively, teaches that cytoplasmic male sterility from

Helianthus Annuus can be transferred to *Cichorium Intybus*, and allegedly also to *Cichorium Endivia*.

Again, it cannot be seen how DELESALLE could contain any teaching to the one skilled in the art that would be additional to those of SIDIKOU-SEYNI, in view of arriving at the claimed invention.

CONCLUSION

(1) It flows from the discussion of the various documents above that, as the Official Action admits, the teachings of SIDIKOU-SEYNI are restricted to the disclosure of the previous existence of a F1 generation plant originating from a crossing between *Cichorium Intybus* and *Cichorium Endivia*.

However, because SIDIKOU-SEYNI was not aimed at obtaining F2 generation hybrid plants, this document could not contain any further teaching for the one skilled in the art that would have guided him towards the claimed invention.

(2) It also flows from the discussion of the various documents above that none of the other documents applied in the Official Action would have:

(a) prompted the one skilled in the art obtain F2 generation plants, since RCIK disclosed essentially the weaknesses of the F2 generation plants that had been obtained in the art using conventional breeding techniques, and that none of TAN nor DELESALLE

contained any technical information that would be useful for one skilled in the art to arrive at the claimed invention; and

(b) provided any guidance to one skilled in the art regarding the specific steps and condition to implement for designing a successful method of obtaining recombinant plant originating from an initial crossing between *Cichorium Intybus* and *Cichorium Endivia*, including the highly specific forcing step d).

(3) Finally, it is again underlined that the one skilled in the art would not have pursued the way taken by RICK in 1950 consisting of crossing *Cichorium Intybus* with *Cichorium Endivia*. He would have certainly not considered working further with these plants that show such morphological deficiencies.

(4) Still further, for such an "economically important crop", applicant would like to point out that it thus took more than 50 years to move from the plants disclosed by RICK to the plants that are disclosed in the instant patent application. Given such an economic importance, it appears highly doubtful that the claimed invention was so obvious to the one skilled in the art at the time of that the invention was made.

Therefore, in view of the argument above, the claimed method is not rendered obvious over the proposed combination, and the same remarks also apply to the various recombinant plants that

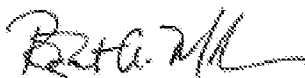
re obtained by performing the claimed method. Accordingly, withdrawal of the rejection is respectfully requested.

In view of the foregoing remarks, the application is in condition for allowance at the time of the next Official Action. Allowance and passage to issue on that basis is respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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